AMENDED CLAIM SET:

1. (currently amended) A method for producing ~~a germanium~~ an oxynitride layer, ~~on a Ge-based material;~~ the method comprising: ~~the steps of:~~

providing a wafer of Ge-based material, the Ge-based material having a first surface; and

carrying out a two step process consisting of a first step and a second step, wherein the first step consists of incorporating a first concentration consisting essentially of nitrogen ~~into a surface layer~~ underneath a the first surface, and wherein the ~~of the Ge-based material; and~~ second step, which follows the first step, consists of inducing growth of the oxynitride layer by exposing the first surface ~~of the Ge-based material~~ to an oxygen containing ambient, wherein the first concentration consisting essentially of nitrogen ~~in the surface layer~~ is controlling the growth of the oxynitride layer.

2. (original) The method of claim 1, wherein the produced oxynitride layer has less than about 6nm of equivalent oxide thickness (EOT).

3. (original) The method of claim 2, wherein the produced oxynitride layer has between 0.5nm and 5nm of EOT.

4. (original) The method of claim 1, wherein the Ge-based material consists essentially of Ge.

5. (currently amended) The method of claim 1, wherein the step of incorporating the first concentration consisting essentially of nitrogen is carried out by subjecting the first surface to a nitrogen containing gas under thermal conditions.

6. (original) The method of claim 5, wherein the nitrogen containing gas is NH_3.

7. (original) The method of claim 6, wherein the thermal conditions are selected to be a temperature between 450°C and 700°C applied for between 1 second and 300 seconds.

8. (currently amended) The method of claim 1, wherein the step of incorporating the first concentration of consisting essentially nitrogen is carried out by ion implanting a nitrogen dose into the first surface.

9. (original) The method of claim 8, wherein in the step of ion implanting the nitrogen dose is selected to be between about 1E15 per cm^2 and 2E16 per cm^2.

10. (original) The method of claim 9, wherein in the step of ion implanting an implantation energy is selected to be between 0.5KeV and 10keV.

11. (original) The method of claim 9, wherein the step of ion implanting is carried out through a screen layer.

12. (currently amended) The method of claim 1, wherein the step of incorporating the first concentration consisting essentially of nitrogen is carried out by subjecting the first surface to a nitrogen containing plasma.

13. (original) The method of claim 12, wherein the nitrogen containing plasma is being applied with a power of between about 25W and 1000W, at a temperature of between about room temperature and 500°C, and for a time of between about 1sec and 300sec.

14. (currently amended) The method of claim 1, wherein ~~the~~ an integrated value of the first concentration consisting essentially of ~~incorporated~~ nitrogen ~~is~~ has a surface density

of between about 1E14 per cm^2 and 3E15 per cm^2.

15. (original) The method of claim 1, wherein the exposing to the oxygen containing ambient is carried out by subjecting the first surface under thermal conditions to species selected from the group consisting of O_2, O_3, H_2O, NO, N_2O, and combinations of these species thereof.

16. (currently amended) The method of claim 15, ~~said~~ the thermal conditions are selected to be a temperature between 500°C and 700°C applied for between 1 minute and 30 minutes.

17. (original) The method of claim 1, wherein the exposing to the oxygen containing ambient is carried out by subjecting the first surface to an oxygen containing plasma.

18. (original) The method of claim 17, wherein the oxygen containing plasma is being applied with a power of between about 25W and 1000W, at a temperature of between about room temperature and 500°C, and for a time of between about 1sec and 300sec.

19. (currently amended) The method of claim 1, further comprising the step of cleaning the first surface before the incorporating of the first concentration consisting essentially of nitrogen, wherein the cleaning comprises at least one application of an oxidation and oxide removal cycle, wherein the oxidation is accomplished with an H_2O_2 containing solutions, and the oxide removal is accomplished by a stripping agent, wherein the stripping agent is HF, HCl, or their mixture thereof.

20. (currently amended) The method of claim 1, wherein the first surface is having at least two locations, and wherein the step of incorporating the first concentration consisting essentially of nitrogen is carried out on the at least two locations in a manner to

yield differing first concentrations consisting essentially of ~~the incorporated~~ nitrogen, whereby the produced germanium oxynitride layers on the least two locations have differing EOT.

21. (currently amended) A method for fabricating a high performance Ge-based field effect device, wherein the device comprising a germanium oxynitride layer gate dielectric, and production of the germanium oxynitride layer ~~gate dielectric~~ is comprising ~~the steps of~~:

providing a wafer of Ge-based material, the Ge-based material having a first surface; and

carrying out a two step process consisting of a first step and a second step, wherein the first step consists of incorporating a first concentration consisting essentially of nitrogen ~~into a surface layer~~ underneath a the first surface, and wherein the ~~of the Ge-based material; and~~ second step, which follows the first step, consists of inducing growth of the oxynitride layer by exposing the first surface ~~of the Ge-based material~~ to an oxygen containing ambient, wherein the first concentration consisting essentially of nitrogen ~~in the surface layer~~ is controlling the growth of the oxynitride layer.

22. (original) The method for fabricating of claim 21, wherein the high performance Ge-based field effect device is a Ge MOS transistor.

23. (currently amended) The method for fabricating of claim 21, wherein the germanium oxynitride layer gate dielectric has between 0.5nm and 5nm of EOT.

24. - 30. (canceled)